

**US 301 Project Development  
Final Environmental Impact Statement  
November 2007**



**SUMMARY**

**A. Administrative Action**

- Draft Environmental Impact Statement
- Section 4(f) Evaluation
- Final Environmental Impact Statement
- Record of Decision

**B. Informational Contacts**

Project information, including an electronic version of this document, is available on DelDOT’s website, [www.deldot.gov/information/projects/us301/](http://www.deldot.gov/information/projects/us301/). Additional information concerning this project may be obtained by contacting:

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**C. Summary Table of Contents**

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**D. Description of Proposed Action/Purpose and Need**

The US 301 Project Development effort proposes to construct a four-lane, fully access controlled, tolled highway between the Delaware/Maryland state line and State Route (SR) 1 (US 301 mainline), with a two-lane, fully access controlled, tolled Spur Road from the US 301 mainline in the vicinity of Armstrong Corner Road to the Summit Bridge.

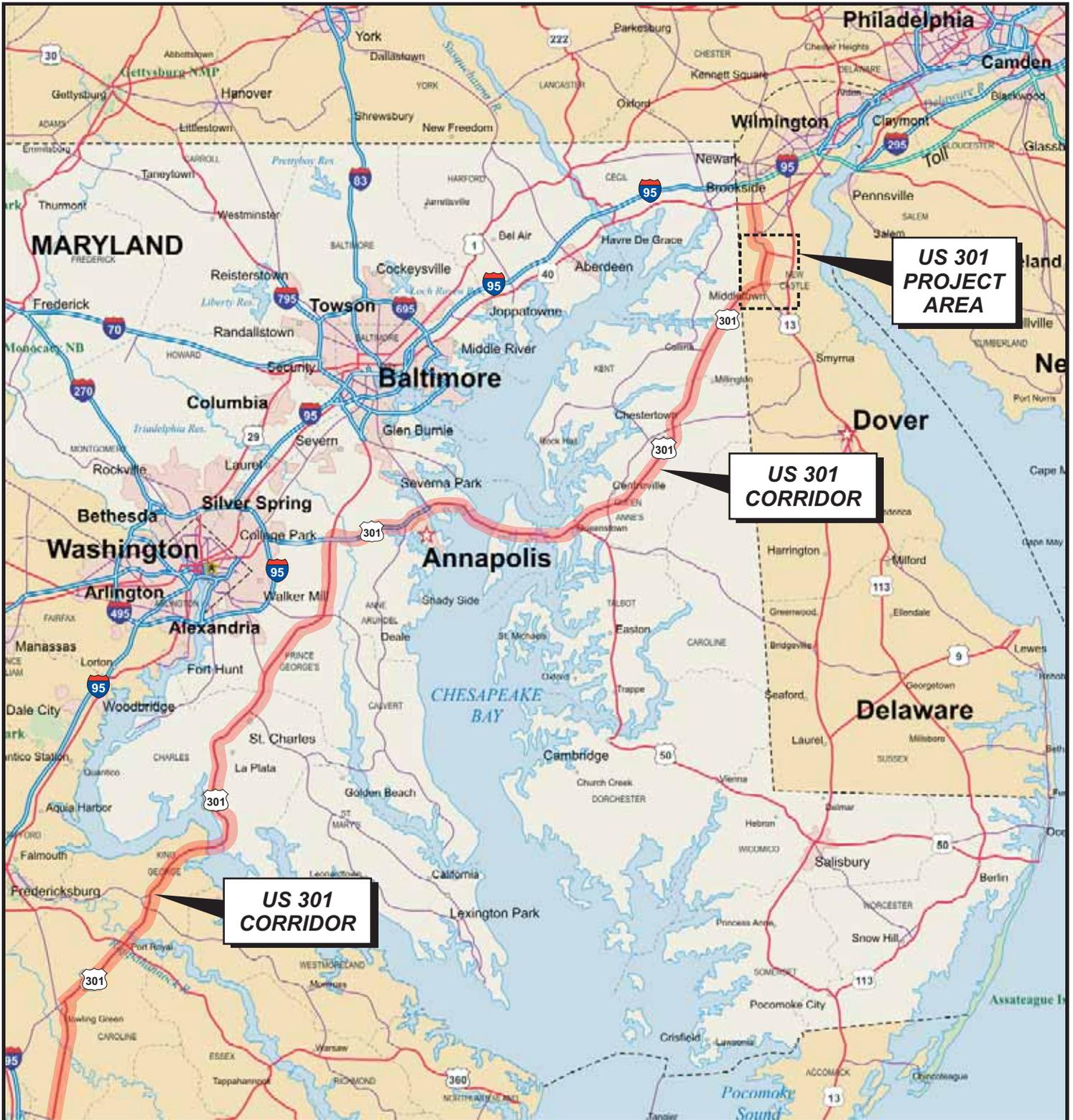
The purpose of the US 301 Project Development effort is to address existing and future congestion on US 301, improve safety, and better manage the heavy truck volumes through the project area. The project proposes to provide improved travel conditions for vehicles traveling north/south between US 301 at the Delaware/Maryland state line and points north of the Chesapeake and Delaware (C&D) Canal via SR 896 (Summit Bridge) and SR 1 in southern New Castle County, Delaware. *Figure S-1* provides the regional context of US 301; *Figure S-2* shows the project area.

The need for the project is demonstrated by the historic growth in the volume of vehicles traveling north/south on US 301 in the project area, and recent and continuing growth in residential land use and concurrent increasing population in the area. As a result of the increasing conversion of farmland to residential use, the Delaware Department of Transportation (DelDOT) is seeking to identify and preserve an appropriate transportation corridor before encroaching development precludes the availability of a route for commuter and long-haul transportation.

Highway safety and the high percentage of truck traffic using US 301 also demonstrate the need for the project. A high number of accidents (over 1,200 over the past five years) have been reported in the project area, with over 34 percent of the accidents involving injuries or death. A total of 18 fatalities occurred in the US 301/SR 896 corridor, with 11 on US 301 south of the C&D Canal. The US 301 corridor currently functions as a regional truck route, bypassing the congestion and tolls of the I-95 corridor, resulting in a high ratio of trucks, 25 to 30 percent of the overall traffic at the Delaware/Maryland state line, traveling on US 301. The mix of trucks with local traffic has affected roadway capacity, operations and safety. Approximately 95 percent of the northbound truck traffic originating south of Middletown is destined to points northeast of the C&D Canal, with nearly 90 percent of that destined for places outside of Delaware.

**E. Description of Alternatives**

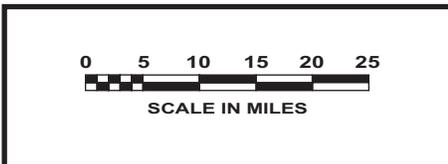
Alternatives initially considered in the project development process included the No-Build Alternative as well as several build alternatives utilizing both on-alignment (existing US 301 and existing SR 896) and new locations. The initial Range of Alternatives included roadway alignments originally considered in the 1993 Draft Environmental Impact Statement (DEIS) and in the 2000 Major Investment Study (MIS). The Project Team also reviewed multi-modal improvements identified in the MIS, some which have already been implemented.



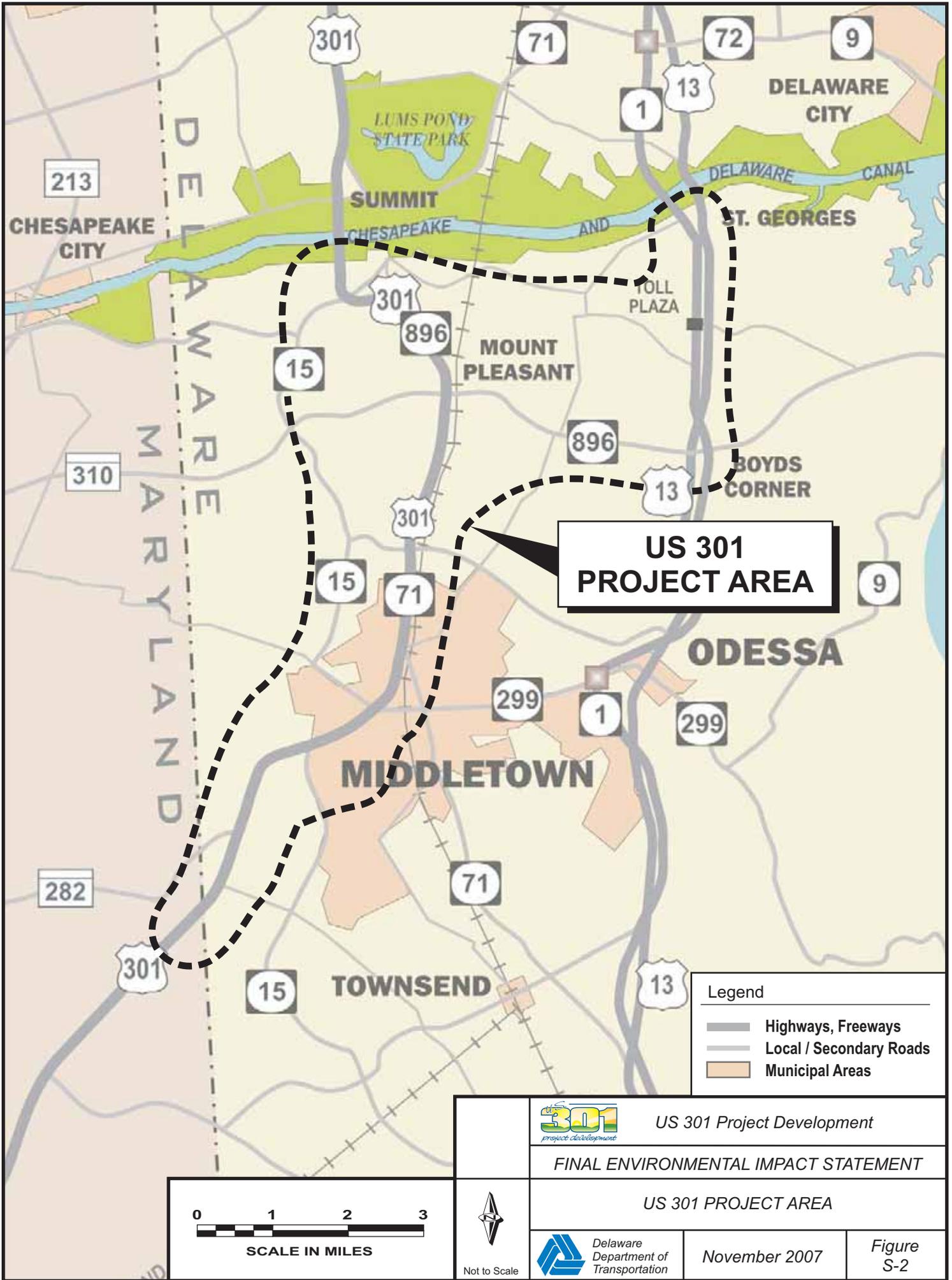
**US 301  
CORRIDOR**

**US 301  
CORRIDOR**

**US 301  
PROJECT  
AREA**



 US 301 Project Development			
		FINAL ENVIRONMENTAL IMPACT STATEMENT	
 As Shown		REGIONAL MAP	
		 Delaware Department of Transportation	November 2007



**US 301  
PROJECT AREA**

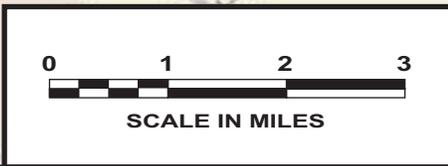
Legend	
	Highways, Freeways
	Local / Secondary Roads
	Municipal Areas



US 301 Project Development

FINAL ENVIRONMENTAL IMPACT STATEMENT

US 301 PROJECT AREA



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Figure  
S-2

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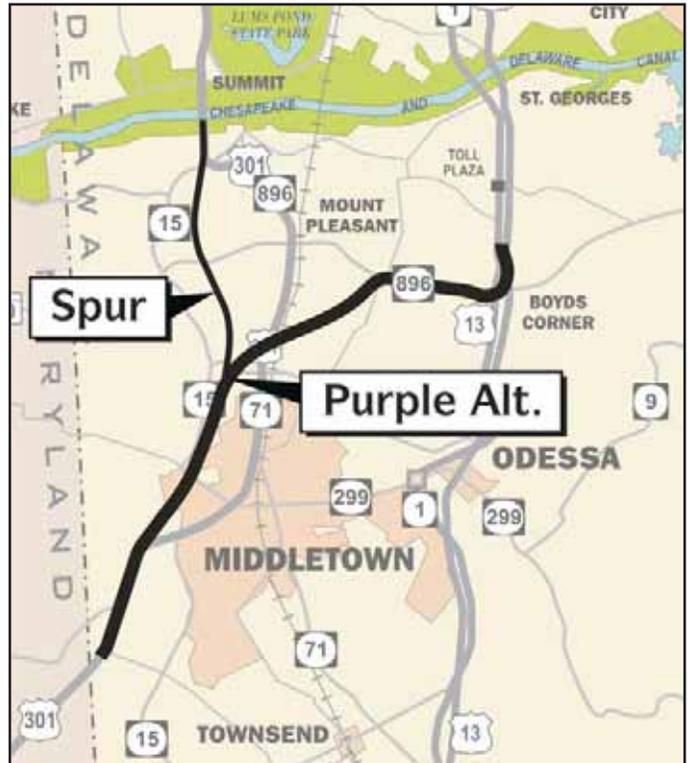
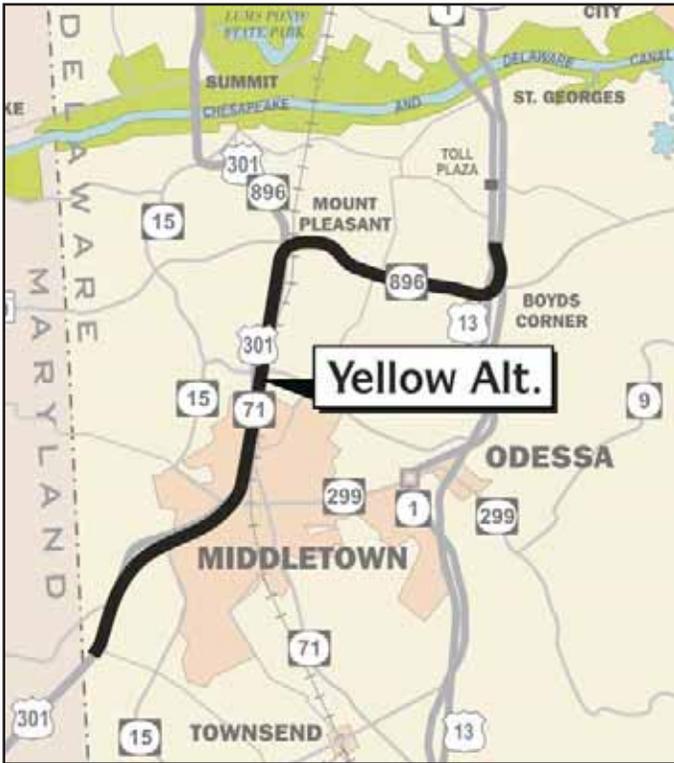
The No-Build Alternative and ten build alternatives were initially developed for the project. Three (3) preliminary alternatives (Alternative 2 - Light Blue, Alternative 3 - Black and Alternative 4 - White) were dropped from consideration because they did not meet the project purpose and need. Based on evaluations of environmental impacts of the remaining seven build alternatives, their ability to meet project purpose and need, engineering considerations, resource agency consultation and coordination, and public input, DelDOT recommended that three alternatives not be retained for detailed study in the DEIS: Orange, Blue and Red.

The No-Build Alternative and four build alternatives (Yellow, Purple, Brown (North and South Options) and Green (North and South Options)) were carried forward for detailed evaluation in the DEIS (*Figure S-3*). All of the build alternatives provide a four-lane, limited-access tolled highway from the Delaware/Maryland state line to SR 1, south of the C&D Canal. Two of the build alternatives (Purple and Green) also provide a two-lane, limited access Spur Road from the new US 301 to the Summit Bridge. Details of the alternatives carried forward are summarized below and described in detail in **Chapter II, Section B**. Options considered in certain areas of the build alternatives are also described in detail in **Chapter II, Section C**.

**F. DelDOT's Preferred Alternative**

Following publication of the Draft EIS in November 2006, a Combined Location-Design Public Hearing was held on January 8 and 9, 2007 with the US Army Corps of Engineers. Comments on the DEIS were received through testimony at the hearing, written comments submitted during the hearing, or during the public comment period, which extended through February 3, 2007. Based upon the comments received from the public and resource agencies, continued consultation with the resource and regulatory agencies, and coordination with the public and individual stakeholders and property owners, the recommended Preferred Alternative was refined. Additional engineering was undertaken to avoid or minimize impacts, adjust alignments, and refine the profiles of the design. On May 16, 2007, the Delaware Secretary of Transportation announced that the **Green Alternative, North Option, with Armstrong Corner Road Area Option 2A, Summit Interchange Option 3B, and Ratledge Road Area Option 4B Modified** as its Preferred Alternative for the US 301 Project. The Preferred Alternative was approved by the Delaware Council on Transportation.

The Preferred (Green North) Alternative extends north from the state line west of Middletown to the vicinity of Armstrong Corner Road, where it continues northeast to cross existing US 301. The alignment continues north, crossing over SR 896, and extends east, south of the Airmont community, and ties into SR 1 south of the C&D Canal. In the vicinity of Armstrong Corner Road, a two-lane Spur Road extends north to the Summit Bridge. Access is provided via interchanges south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road (existing US 301), at Jamison Corner Road north of SR 896, at SR 1 south of the C&D Canal crossing, and on the Spur Road at Bethel Church Road extended and south of the Summit Bridge. A full description of the Preferred Alternative is included in **Chapter II, Section A**.



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ALTERNATIVES RETAINED FOR DETAILED EVALUATION



Not to Scale



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Figure S-3

DelDOT's preference for the Green North Alternative is based upon consideration of the potential for impacts to communities (property acquisition, potential relocation issues, and community facilities (including Summit Airport); natural resources (wetlands and other Waters of the US, potential bog turtle habitat, and forests); historic resources (historic buildings and structures, potential archaeological sites); and engineering design (ability to meet project purpose and need, design complexity, construction costs). The Preferred Alternative meets the project's purpose and need while minimizing impacts to the environment. The preferred options were chosen based on their ability to minimize impacts to the natural environment and community resources.

## **G. Alternatives Not Preferred**

### **1. Alternatives Retained for Detailed Evaluation**

The No-Build Alternative and four build alternatives, two with optional north and south alignments, were retained for detailed evaluation during the alternatives analysis process. Full descriptions of these alternatives and the reasons they are not preferred are detailed in **Chapter II, Section B**.

#### **a. No-Build Alternative**

The No-Build Alternative was carried forward for detailed evaluation as a baseline condition. The No-Build Alternative reflects the existing roadway conditions, with only scheduled maintenance and minor roadway and safety improvements. Programmed improvements included in the Delaware Department of Transportation *Capital Transportation Plan FY 2008 – FY 2013* (CTP) are assumed under the No-Build Alternative and all of the build alternatives, but the alternatives do not include any of the impacts associated with the CTP improvements. The build alternatives were compared to the No-Build Alternative with respect to impacts to the natural and built environment.

#### **b. Yellow Alternative**

The Yellow Alternative extends north parallel to existing US 301 from the state line to Mount Pleasant and then extends east-west to SR 1, parallel to SR 896 (Boyds Corner Road). Four interchanges provide access to service roads south of Middletown, to existing US 301 north of Middletown, to existing SR 896 at Mount Pleasant, and to SR 1 north of Boyds Corner Road. The Yellow Alternative was not preferred because of potential physical impacts to historic properties, the high number of potential residential (128) and business (58) displacements, and the high number of potential impacts to wetlands (50.5 acres in 33 wetlands) and waters of the US (20,708 linear feet). As shown in **Table S-1**, these potential impacts were the highest among all of the retained alternatives evaluated.

**c. Purple Alternative**

The Purple Alternative extends north from the state line on a new location, west of Middletown and existing US 301 (commonly referred to as the ridge route or ridge alignment) to the vicinity of Armstrong Corner Road. From Armstrong Corner Road, the Purple Alternative extends on new location northeast to SR 896 (Boyd's Corner Road) and then east along the SR 896 (Boyd's Corner Road) alignment to SR 1. In the vicinity of Armstrong Corner Road, a two-lane Spur Road extends north along the ridge route to the Summit Bridge. Interchanges provide local access south of Middletown at Levels Road extended, north of Middletown in the vicinity of Armstrong Corner Road, north of Boyd's Corner Road on Jamison Corner Road, at SR 1, and on the Spur Road at Bethel Church Road extended and south of the Summit Bridge. The Purple Alternative was not preferred because of the high number of community impacts associated with the portion of the alternative that parallels Boyd's Corner Road. Specifically, of the 148 potential residential noise impacts, 45 were identified at residences and communities along Boyd's Corner Road where mitigation would not be feasible; potential impacts to the New Covenant Presbyterian Church; potential farmland/approved development impacts; and potential noise impacts to the Cedar Lane Educational Campus.

**d. Brown Alternative, North and South Options**

The Brown Alternative extends north from the state line on the ridge route, west of Middletown, to south of Summit Bridge. The North Option turns east, north of Summit Bridge Farms, while the South Option turns east south of Summit Bridge Farms. Both options continue east and join SR 1 south of the C&D Canal crossing and north of the SR 1 Biddles Corner Toll Plaza. Local access is provided by interchanges south of Middletown at Levels Road extended, south of Summit Bridge, on SR 896 north of Summit Airport, and on Jamison Corner Road north of Boyd's Corner Road and at SR 1. The Brown Alternative Options were not preferred because of their potential impacts to the Summit Airport and the potential high number of communities impacted by the options. Potential impacts to natural environmental resources were similar in numbers to those of the Purple and Green Alternatives; however, the Brown Alternative Options were opposed by the Delaware Department of Natural Resources and Environmental Control (DNREC) because of their potential impacts to high quality wetlands and relatively undisturbed natural stream systems and wildlife corridors in the area adjacent to and within the C&D Canal State Wildlife Area and State Natural Area.

**e. Green Alternative, South Option**

The Green Alternative extends north from the state line on the ridge route, west of Middletown, to the vicinity of Armstrong Corner Road, where it curves northeast crossing existing US 301, the Norfolk Southern Railroad, and SR 896 before curving east to join SR 1 south of Scott Run. In the vicinity of Armstrong Corner Road, a two-lane Spur Road extends on the ridge route to the Summit Bridge. The Green South Option provides local access via interchanges south of Middletown at Levels Road extended, north of Middletown in the vicinity of Armstrong Corner Road, north of Boyd's Corner Road on Jamison Corner Road, at SR 1, and on the Spur Road at

Bethel Church Road extended and south of the Summit Bridge. Although the impacts to natural and human environmental resources were similar between the North and South Options, the South Option was not preferred for its additional impacts to the sensitive Scott Run watershed, i.e., a longer and more skewed bridge crossing and an additional crossing over Scott Run when compared to the Green North Option. DNREC, the ACOE and the EPA also preferred the Green North Option over the South because of the South Option's larger impacts to wetlands (28.3 acres in 40 wetlands) and the additional crossing of Scott Run.

## **H. Alternative Options**

Multiple options for the four retained alternatives were evaluated at three locations – Armstrong Corner Road, Boyds Corner Road, and south of Summit Bridge on the Spur Road – to determine the most effective design with the least impacts to the socioeconomic and natural environment, as shown on *Figure S-4*. An additional set of options was evaluated in the Ratledge Road area for the Preferred Green North Alternative to determine the most acceptable compromise between saving active farms and avoiding wetlands. The following alternative options were evaluated, each of which is described in detail in **Chapter II, Section C**.

### **1. Armstrong Corner Road (ACR) Area Options (Purple and Green Alternatives)**

Four options for the interchange with existing US 301, north of Middletown, were considered in the ACR area in an effort to minimize impacts to wetlands, forest, residences, businesses and the Middletown Baptist Church. These options are detailed in **Chapter II.C.1**.

ACR Area Option 1 would provide a diamond interchange between the new US 301 and Armstrong Corner Road east of Choptank Road, with ramps providing local access on Armstrong Corner Road, west of existing US 301. Armstrong Corner Road would overpass both the new US 301 mainline and spur road.

ACR Area Option 2 would provide a diamond interchange between new US 301 and a relocated existing US 301. Armstrong Corner Road would be realigned to overpass the Spur Road. New US 301 would overpass Armstrong Corner Road south of the diamond interchange.

ACR Area Option 2A (Preferred) would provide right-on/right-off ramps between new and existing US 301. The entrance and exit ramps would be located on existing US 301. This Option is preferred because it locates the interchange on existing US 301 without requiring its relocation, has significantly less right of way and relocation impacts than Option 2 and avoids direct impacts to the Middletown Baptist Church building and parking area. The Option provides an acceptable level of impacts to wetlands (the majority of impacts are to medium quality wetlands (8.7 of 10.0 acres of impact)) and the least (9.9 acres) impacts to forests in the area.



ACR Area Option 3 would provide a diamond interchange between the new US 301 and Armstrong Corner Road similar to Option 1 but further to the south than Option 1.

## **2. Boyds Corner Road (BCR) Area Options (Yellow and Purple Alternatives)**

Four options were developed for the Yellow and Purple Alternatives in this area to minimize impacts to existing farms, the New Covenant Presbyterian Church and the proposed Bayberry Town Center. The BCR Area options are detailed in **Chapter II.C.2**. The options at Boyds Corner Road do not pertain to the Preferred Alternative.

The BCR Area Option 1 would cross to the north of SR 896 just west of Cedar Lane Road and be less than 300 feet north of SR 896 at Jamison Corner Road, remaining on the north side of existing SR 896 to just east of Jamison Corner Road. The option would then cross to south of SR 896 and follow the south side of existing Boyds Corner Road to cross over Shallcross Lake Road, US 13, and SR 1 and tie into SR 1.

The BCR Area Option 2 mainline alignment would pass over SR 896 (Boyds Corner Road) west of Cedar Lane Road, continue northeast and cross Jamison Corner Road approximately 2,200 feet north SR 896 along the southern side of the Emerson Dairy Farm. Option 2 would continue east through the Emerson Farm, turn towards the south to cross over Milford Drive and SR 896, and continue on the south side and parallel to existing SR 896, crossing over US 13 and SR 1 before tying into SR 1.

The BCR Area Option 3 mainline would pass over Boyds Corner Road west of Cedar Lane Road, then cross over Jamison Corner Road approximately 1,500 feet north of SR 896, traverse the northwest corner of the proposed Bayberry Town Center property and the southeast corner of the Emerson Dairy Farm, continue east through the proposed Town Center, and then turn towards the south to cross over Milford Drive and SR 896 and continue on the south side of and parallel to existing SR 896, crossing over US 13 and SR 1 before tying into SR 1.

The BCR Area Option 4 mainline would pass over Boyds Corner Road, cross over Jamison Corner Road approximately 750 feet north of SR 896, traverse the southwest corner of the proposed Bayberry Town Center, and cross over SR 896 to the south side approximately 2,400 feet east of Jamison Corner Road. The alignment would cross over Shallcross Lake Road, US 13 and SR 1 before tying into SR 1.

## **3. Summit Interchange (SI) Area Options (Yellow, Purple and Green Alternatives)**

Two interchange options were considered for the Yellow Alternative at the SR 15/SR 896 intersection at the base of Summit Bridge to address safety and traffic issues. SI Options are detailed in **Chapter II.C.3**.

SI Area Option 1 for the Yellow Alternative would provide a partial cloverleaf interchange in the present location of the SR 15/SR 896 intersection at the base of Summit Bridge.

SI Area Option 2 for the Yellow Alternative would include a grade-separated interchange in the present location of the SR 15/SR 896 intersection at the base of Summit Bridge, providing an at-grade through movement for vehicles traveling to/from SR 896 and the Summit Bridge by improving the existing curve.

Five interchange options were considered for the Purple and Green Alternatives at the SR 15/SR 896 intersection at the base of Summit Bridge to address safety and traffic issues.

SI Area Option 1 would provide a full diamond interchange at the intersection of SR 15, SR 896, and the Spur Road, with free traffic flow between the Spur Road and the Summit Bridge and signalized ramp termini.

SI Area Option 2 would provide a directional “Y” interchange between SR 896 and the US 301 Spur Road, improving the sharp curve (the direct movement) on SR 896 to the desired design speed and providing a continuous traffic flow for the major movements on SR 896.

SI Area Option 3 would provide a directional “Y” interchange between SR 896 and the US 301 Spur Road, similar to SI Area Option 2, with a cul-de-sac on Bethel Church Road both east and west of the interchange. Access to SR 15 would be provided by a signalized intersection at the Spur Road and an extended Bethel Church Road.

SI Area Option 3B (Preferred) would provide the same roadways and interchange ramps as Option 3, but would replace the signalized intersection at Bethel Church Road extended and the Spur Road with a partial cloverleaf interchange. SI Area Option 3B is preferred because it provides free flowing traffic on the Spur Road, does not include any signals/intersections on the Spur Road (thus reducing noise associated with stopping/starting), and it provides an unbroken median along the entire Spur Road length.

SI Area Option 4 would provide the same directional “Y” interchange between SR 896 and the US 301 Spur Road as Option 3. In addition, access to the Spur Road would be provided by signalized intersections at Bethel Church Road extended, Churchtown Road and Old Schoolhouse Road.

#### **4. Ratledge Road (RR) Area Options (Green North Alternative only)**

Seven options were considered for the Green North Alternative following publication of the DEIS to address potential impacts to active farms in the Boyds Corner Road area between Ratledge Road and Jamison Corner Road while minimizing impacts to wetlands and forests, especially those of high quality. The RR Area Options are detailed in **Chapter II.C.4**. All of the options extend north before curving east to interchange with Jamison Corner Road.

RR Area Option 1 alignment would follow an almost due north alignment, crossing Boyds Corner Road approximately 450 feet east of Ratledge Road.

RR Area Option 2 would follow an almost due north alignment, approximately 350 feet east of Option 1, crossing Boyds Corner Road approximately 875 feet east of Ratledge Road.

RR Area Option 3 would follow a more northeasterly alignment, crossing Boyds Corner Road approximately 1,350 feet east of Ratledge Road.

RR Area Option 4 would follow an almost due north alignment, crossing Boyds Corner Road approximately 2,900 feet east of Ratledge Road.

RR Area Option 4A would follow an alignment slightly to the east of Option 3 and west of Option 4, crossing Boyds Corner Road approximately 1,900 feet east of Ratledge Road.

RR Area Option 4B would follow the Delaware Power and Light (DP&L) right-of-way, crossing Boyds Corner Road approximately 2,140 feet east of Ratledge Road.

RR Area Option 4B Modified (Preferred) shifts the Option 4B alignment on the north side of Boyds Corner Road slightly eastward to minimize impacts to a higher quality wetland system and forest land.

## **I. Summary of Potential Impacts**

The environmental impacts of the Preferred Alternative are described in **Chapter III** and summarized in *Table S-1* and the following sections. A summary of the impacts considered during the evaluation of the four retained alternatives, including the Green North Alternative, is also presented below and summarized on *Table S-2* following the discussion. Changes that have occurred in the Preferred Alternative impacts, when compared to the impacts detailed for the Green North Alternative in the DEIS, are also discussed in the following paragraphs.

Three refinements of the Green North Alternative have been undertaken since its recommendation as Preferred Alternative in the Draft Environmental Impact Statement (DEIS); each has contributed to an increase in some impacts for the Preferred Alternative. It is estimated that these refinements would have brought about a similar increase in the levels of impacts from all of the build alternatives if they had all been subjected to a similar level of design refinement.

- First, the design of the Preferred Alternative was refined as a result of comments received on the DEIS. Refinements in the engineering included alignment modifications, refined sections based on topography, and refined stormwater management design based on the identification of existing drainage areas. These refinements required that the roadway elevations be raised in some areas to provide adequate drainage for stormwater management, resulting in an increased Limit of Disturbance (LOD). Prior to refined engineering, the LOD for the Green North Alternative was 897 acres; the Preferred Alternative LOD encompasses 941 acres, a five percent increase. This increase would have been seen in all of the build alternatives, had they been subjected to a similar level of engineering design.



- Second, the forest layer was refined to reflect current coverage, based on more recent and improved aerial photography (2006) along the Preferred Alternative alignment. This resulted in several previously classified forested wetlands being reclassified and the inclusion of hedgerows not previously included. The resulting increases in forest coverage, along with the expanded LOD, led to an increase in the acreage of impacted forestland for the Preferred Alternative that would, in some areas, apply proportionally to the other build alternatives.
- Finally, improved wetland delineation for the Preferred Alternative included the separate delineation of streams that had previously been included within wetland systems (i.e., streams within a wetland corridor); ephemeral, intermittent and perennial waters of the US not surrounded by wetlands were also surveyed; and traditional field survey methods were used to precisely locate wetland boundaries previously based on GPS surveys.

**Table S-1: Summary of the Impacts of the Preferred Alternative**

<b>Resource</b>	<b>Preferred Alternative</b>
Alignment Length (mi.)	17.5
Total Area (acres) <sup>1</sup>	941
Total Displacements (No.)	21
Affected Properties (No.)	143
Wetlands (acres) <sup>2</sup>	35.0
Wetlands (No.)	63
Tidal Wetlands (acres) <sup>3</sup>	0
Waters of the US (lf)	17,883
100-Year Floodplain (acres)	0.7
Agricultural Districts (No./acres)	1/32.6
Agricultural Easements (No./acres)	2/10.9
Prime Farmland Soils (acres)	616
Hydric Soils (acres)	166
Upland Forested Land (acres)	63.7
Residential Noise Impacts (No.)	133
Residential Noise Impacts after Proposed Visual Berms (No.)	46
National Register Historic Properties: Physical (No.) <sup>4</sup>	0
National Register Historic Properties: Visual or Noise (No.)	15
Capital Cost (\$M) (2006 dollars)	\$534-\$590

*Notes: 1. Based on preferred options for Armstrong Corner Road Area, Boyds Corner Road Area, Summit Interchange Area and Rattlesnake Road Area (Preferred only). Impacts based on Limit of Disturbance as defined in Chapter II.*

*2. Total area of potential ACOE wetlands impacted.*

*3. DNREC tidal wetlands acres included in total wetland.*

*4. One historic archaeological site for which National Register eligibility has not been determined will be directly impacted by the Preferred Alternative.*

## **1. Socioeconomic Resources**

The impacts of the build alternatives were evaluated on socioeconomic resources, including residences, businesses, land use, planned development, farms, and aesthetics in the project area.

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The No-Build Alternative will not impact any properties. The Preferred Alternative will impact a total of 143 properties, of which 26 will be full acquisitions and 117 will be partial acquisitions. DelDOT will obtain a permanent easement on one additional property. Occupants of approximately 21 residential or business properties will require relocation assistance, including 17 total acquisitions and four partial acquisitions, resulting in 35 separate relocation assignments.

Relocation assistance will be provided to all residents and businesses as well as owners of properties as necessary in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Act (1970) and Amendments (1987)*; see **Appendix F**. A relocation plan for the project is also included in the Appendix.

As shown in **Table S-2**, the DEIS retained alternatives would impact between 100 and 377 properties; of those, between 12 and 207 are total property acquisitions. The most property acquisitions are with the Yellow Alternative (207 total and 170 partial takings). The Purple, Brown and Green South would require between 12 and 30 total takings and between 88 and 124 partial property takes (**Chapter III Section A.5**).

There are many communities located within 600 feet of one or more of the proposed alternatives alignments. Most of the communities consist of neighborhoods of between 20 and 200 single-family homes within individual developments. The community of Middletown Village is the largest group of homeowners in the project area, with approximately 290 single family residences and almost 500 town homes (**Chapter III Section A.6**). The Town of Middletown will be impacted by the Yellow Alternative as it bisects the town, affecting local access and cross-town connectivity and impacting many existing businesses and residences that front existing US 301 and SR 896 (Boyd's Corner Road). The Brown, Purple and Green Alternatives would have less impact on existing communities, however, these alternatives will create individual property impacts within communities.

The No-Build Alternative would not impact communities in the project area. There are potential aesthetic and visual impacts to communities and individual properties within the viewshed of the alternatives, including the Preferred Alternative (**Chapter III Section A.8**). The proposed new roadway will be visible from numerous homes in the project area whose existing views are of farm fields and a rural landscape. In some areas, proposed visual screening earth berms will minimize the effects of this change. The Preferred Alternative will provide visual screening berms for the communities of Southridge, Middletown Village, Springmill, Chesapeake Meadow and Airmont.

There are no impacts to community facilities from the No-Build Alternative. The Preferred Alternative would require acquisition of property from the Appoquinimink High School. Potential impacts to community facilities from the four build alternatives include the acquisition of property from Appoquinimink High School (Preferred, Purple, Brown and Green South Alternatives), access impacts to the Odessa Fire & Rescue Station 4 (Purple and Yellow), and

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impacts to Summit Airport (Brown Alternative) (**Chapter III Section A.4**). There are no impacts to parks and recreation areas.

The No-Build would not affect land use; the Preferred Alternative will impact 941 acres of existing land use, converting the acreage to transportation use. Design refinements of the Preferred Alternative that required raising the elevation of the roadway in some areas to assure proper drainage and channel stormwater runoff increased the amount of land use change from 897 acres to 941 acres. A proportional increase would likely apply to the other alternatives not subjected to refined design. As recorded in the DEIS, a comparison of land use changes for the retained alternatives indicated between 870 and 902 acres would be converted from existing uses to transportation use. The greatest land use change is for agricultural lands; the Preferred Alternative would convert 757 acres. The retained alternatives would convert between 521 and 767 acres to transportation use (**Table III-3** in **Chapter III Section A.2**). Much of this land is already proposed for urban development.

All of the alternatives, except the No-Build, will impact some planned development. The Preferred Alternative will affect areas of Westown, Pleasanton, Churchtown Manor, Scott Run Business Park, the Village of Scott Run, Windsor at Hyetts Corner and the Whitehall Properties. The Westown development area (**Table III-4**) would be impacted by construction of the Yellow, Brown, Purple and Green Alternatives. Scott Run Industrial Park will be affected by construction of the Green and Brown Alternatives. The Villages of Bayberry would be affected by the Yellow, Purple and Green South Alternatives.

The No-Build Alternative will not affect farms or farmland in the project area. The Preferred Alternative, because of the larger footprint based on topography and the need to raise the elevation of the roadway in some sections (discussed earlier), will impact 616 acres of farmland soils and 28 active farm parcels (not planned for development). The Preferred Alternative will impact two preservation easements (10.9 acres) and one preservation district (32.6 acres). The retained alternatives, as shown in the DEIS, would impact between 203 and 437 acres of prime farmland soils and between 9 and 16 active farm parcels not currently proposed for development (**Chapter III Section A.4**). One agricultural easement and one agricultural district would be impacted by the Purple, Brown and Green Alternatives; and one agricultural district would be impacted by the Yellow Alternative.

## **2. Cultural Resources**

The evaluation of cultural resources within the Area of Potential Effect (APE) for the project alternatives for both standing structures and potential archaeological sites is detailed in **Chapter III Section B**. Thirty-one historic buildings and structures were identified within the Area of Potential Effect of the project alternatives that are listed or eligible for listing in the National Register of Historic Places. One known archaeological resource, for which National Register eligibility has not been determined, lies within the LOD of the alternatives.

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The No-Build Alternative will not affect historic properties within the project area. Consultation to apply the Criteria of Adverse Effect to all historic properties affected by the Preferred Alternative (22) resulted in the determination that the Preferred Alternative will have an adverse effect on 12 properties, will have no adverse effect on three properties, and will have no effect on seven properties. The Preferred Alternative will have an adverse effect on one identified archaeological resource. Measures to avoid, minimize and/or mitigate for adverse effects will be determined in consultation with the State Historic Preservation Office (SHPO) and other consulting parties prior to the completion of final design. The results of the assessment of adverse effects and stipulations for completing the treatment of affected properties are detailed in **Section III.B.2** and in the draft Memorandum of Agreement (MOA) in **Appendix H**.

Among the build alternatives, initially there were potential noise and visual effects to between 16 and 22 historic properties. After determining the National Register recommended historic boundaries, only the Yellow Alternative would have direct physical effects on identified historic properties (4). Both Brown Alternatives would physically affect one additional historic property (J. Biggs House, CRS No. N06320); however, assessing the property's eligibility for the National Register would require constructive demolition and investigation of the building's interior.

One identified archaeological resource (N05151) for which National Register eligibility has not been determined will be directly affected by the Purple, Brown and Green Alternatives. A predictive model identified areas of high, medium, low and nil sensitivity to contain archaeological sites. The model was partially tested and refined to further define those areas. Further investigation for archaeological resources will be undertaken and completed, as detailed in the MOA, prior to commencement of any construction activities. The MOA also details the disposition of any identified archaeological remains that may be found within the area of disturbance of the Selected Alternative as well as procedures to be followed for unexpected discoveries.

### **3. Air Quality**

The project area is located within an area of non-attainment for ozone. To comply with regional air quality requirements, following the receipt of the Record of Decision (ROD), the US 301 project will be included in the next applicable WILMAPCO *Regional Transportation Plan* (RTP) and its component air quality conformity analysis. The RTP demonstrates conformity with the State of Delaware *State Implementation Plan* (SIP) applicable air quality budgets.

To determine local impacts, a project level emissions analysis for carbon monoxide (CO) was completed (see *Tables III-28, 29, and 30*). A relative comparison of results of this analysis between the No-Build and build alternatives indicated that there would be little to no difference in the overall emissions of CO within the project area. The air quality analysis results are presented in **Chapter III Section C**. None of the alternatives, including the Preferred Alternative, would cause or exacerbate any violations of applicable National Ambient Air Quality Standards. Mobile Source Air Toxics (MSATs) are discussed in **Chapter III Section K**.

#### **4. Noise**

As presented in the DEIS, between 63 and 108 individual residential noise impacts were identified for the build alternatives. Engineering refinements for the Preferred Alternative required the roadway to be elevated for proper drainage in the vicinity of Bunker Hill Road. This required a mainline alignment shift that brought the roadway closer to the community of Southridge in order to bring the Bunker Hill Road overpass back to grade before the Choptank Road intersection and avoid impacts to the historic property (Rosedale) in the northwest quadrant. When compared to the alignment in the DEIS, this shift caused an increase in individual residential noise impacts in the community of Southridge from 7 to 75, bringing the total noise impacts for the Preferred Alternative to 133 before adding the visual earth berms. This shift would have also occurred with the Brown, Purple and Green South Alternatives, were they subjected to similar engineering refinement.

When the noise abatement criteria were applied to the impacted noise sensitive areas, noise abatement in most areas was not considered feasible and reasonable. With the implementation of visual screening berms, noise impacts for the Preferred Alternative are reduced to 46 residences. The efficacy of visual screening berms to reduce the noise impacts associated with the Preferred Alternative is summarized in *Table III-40* in **Chapter III Section D**.

#### **5. Hazardous Materials Sites**

The Preferred Alternative would not impact or be impacted by any known hazardous materials site. A review of DNREC's environmental databases identified the locations of known contaminated sites in the project area. Of 23 Leaking Underground Storage Tank (LUST) sites with documented or suspected contamination and six Site Investigation and Restoration Sites identified within the project area, up to four would be potentially within the proposed right of way of either the Yellow, Brown or Purple Alternatives. **Chapter III Section E** includes details of the investigation.

#### **6. Natural Resources**

The No-Build Alternative would not affect natural resources in the project area. The project build alternatives, including the Preferred Alternative, would affect project area topography, soils, groundwater, streams, wetlands, floodplains, forests, terrestrial and aquatic habitat, and wildlife. The following is a summary of the natural environmental effects of the project, which are discussed in detail in **Chapter III, Section F**.

The roadway grades of the Preferred Alternative generally follow existing landscape grades; in some locations, the roadway is slightly depressed below grade to minimize visual impacts or elevated above existing grade to assure proper drainage. Most local roads are designed to overpass the US 301 mainline and spur road. Only minor excavation is expected from the project, resulting in minor localized changes in topography. Aquifers that are located within

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geologic formations that underlie the US 301 project area will not be directly affected by any of the project alternatives.

The Preferred Alternative will impact 616 acres of prime farmland soils and 166 acres of hydric soils within the project area. The Preferred Alternative's larger footprint resulted in an increase in impacts over the 437 acres of prime farmland soils and over the 146 acres of hydric soils reported in the DEIS. As reported in the DEIS, the retained alternatives would impact between 203 and 437 acres of prime farmland soils and between 115 and 158 acres of hydric soils. A proportional increase in the acreages of soils impacted is likely with the other alternatives, were they subjected to a similar level of design refinement. Much of the area of prime farmland soils and soils of statewide importance is slated for development.

Bridge and/or culvert construction at stream crossings, sedimentation, removal of riparian vegetation and surface water diversions will result in impacts to water quality within the project area watersheds. The Preferred Alternative will impact a total of 45 surface waters. The impacts of the build alternatives evaluated in the DEIS ranged from 39 to 57 impacts to surface waters.

Impacts to stream and wetland surface water quality may result from each of the build alternatives, including the Preferred Alternative. Direct impacts that result from bridge or roadway construction or those involving the disturbance of stream banks or channels will have an adverse impact on water quality by affecting stream flow rates, temperature and nutrient levels. The clearing and excavation of previously forested or agricultural lands may cause an increase in soil erosion and lead to further sedimentation of surface water features. Similarly, reductions in riparian forest may lead to elevated water temperatures which is directly limiting to cold-water fishes and decreases dissolved oxygen limiting to all aquatic life. Properly designed and constructed stormwater management facilities will control runoff entering surface water features from newly created highways and drainage ways and reduce the potential for sedimentation impact to receiving waters. During construction, the implementation of best management practices (BMPs) will reduce potential negative effects. Proper erosion and sediment control measures will be employed to limit the amount of erosion and the influx of sediment loads into adjacent surface waters.

Each of the alternatives, including the Preferred Alternative, would adversely affect waters of the United States, including wetlands, by displacing or filling these systems. Impacts also include interruption to wetland or stream hydrology. The Preferred Alternative will impact 35.0 acres of wetlands and 17,883 linear feet of waters of the US. These impacts are based upon (1) post-DEIS surveys of the Preferred Alternative wetlands and waters of the US and (2) separate delineation of streams and ditches previously included within wetlands systems (see **Chapter III.F.6.a**). As previously reported in the DEIS, wetlands impacts of the retained alternatives ranged between 18.5 to 50.5 acres, and between 14,278 and 20,708 linear feet of impact to waters of the US.

In accordance with federal and state regulations, avoidance and minimization measures to reduce impacts to wetlands and waters will be implemented. At a minimum, the Preferred Alternative

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will include 53.4 acres of wetland replacement, including forested and emergent areas. Two sites are identified for this, one to the west of Levels Road and one in the Pleasanton area. An additional seven acres of wetland creation and 20 acres of wetland conservation will be included in the Scott Run watershed. The project will also mitigate impacts to streams through restoration of approximately 55 linear feet of stream restoration and the creation of approximately 50 acres of new riparian buffer. Ditch impacts will be mitigated in-kind by the creation of new ditches along the roadway. Evaluation of the potential sites and design of the mitigation is still under development and will be completed during final design.

Impacts to floodplains have not been fully evaluated because of the lack of available floodplain data. The Preferred Alternative will impact 0.7 acres of FEMA floodplains. A detailed survey of floodplain limits will be conducted during the design phase of the project, and a floodplain permit will be obtained from New Castle County. Each of the build alternatives described in the DEIS would require some encroachment into FEMA floodplains, ranging from 1.0 to 1.5 acres.

The Preferred Alternative will impact 63.7 acres of forest, an increase from 34.1 acres reported in the DEIS. The increase is due to new forest and habitat delineations, including the inclusion of hedgerows not previously evaluated, based upon new (2006) aerial photography, and would likely apply proportionally to the other alternatives were they to be similarly delineated. The build alternatives described in the DEIS would impact between 36.8 and 51.0 acres of forested land. Mitigation for forest impacts will include approximately 67 acres on six selected sites. Refer to **Chapter III.F.8.b.(2)**.

Historic records of the federally-threatened bog turtle exist within the project area (**Chapter III Section F.9**). Phase I surveys were completed to determine potential bog turtle habitat. Phase II (visual and physical search) and Phase III (trapping) surveys for bog turtles were completed in compliance with the requirements specified by USFWS and DNREC. No bog turtles were found in any surveyed area. The site of the 1972 bog turtle sighting is identified as potentially occupied. All of the build alternatives will impact the potentially occupied watershed which could result in direct bog turtle impacts and in indirect and direct bog turtle habitat impacts. However, the potential for impacts is minimal for all of the build alternatives, including the Preferred Alternative, because no bog turtles have been found in the watershed since 1972 and detailed Phase II/III surveys conducted in 2006 revealed no bog turtles present. A biological assessment of the affected area was conducted and is summarized in **Chapter III Section F.9**. The result indicated that the project build alternatives “May Effect but is Unlikely to Adversely Affect” the bog turtle.

No other rare, threatened or endangered species are anticipated to be impacted by any of the build alternatives, including the Preferred Alternative. There is a potential for all of the build alternatives to impact the state-listed queen snake, a wetland-habitat species. Minimization of wetland impacts and wetlands mitigation will limit impact to the queen snake. The bald eagle, no longer federally listed as endangered, is still protected by buffer restrictions and time-of-year restrictions on construction activities. No known nest sites are within the federal protective 750-

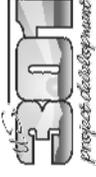
foot buffer or within the one-quarter mile time-of-year restriction buffer of the Preferred Alternative.

## **7. Secondary and Cumulative Effects Analysis**

A secondary and cumulative effects analysis (SCEA) is included within this FEIS. The geographic boundary (*Figure III-24*) for the analysis is based on a composite overlay analysis that includes the extent of the project's influence on regional traffic. The time frame used to fully understand regional changes and the potential future changes within the geographic boundary is from 1980 to 2030.

In the DEIS, the SCEA concluded that the project's completion most likely will not influence the amount or location of development and consequent land use change that would occur in the area; however, the completion of a build alternative, including the Preferred Alternative, may influence the rate that planned development may occur. Additional indirect effects could occur as a result of changes in travel patterns associated with the build alternatives, including traffic volume changes resulting from toll diversions. An interstate Toll Diversion Working Group was convened to address toll diversion issues in Delaware and Maryland and recommend measures to minimize or mitigate toll diversions (**Chapter III.G.4.d**). Travel pattern changes could result in indirect effects to communities and resources outside of the project area.

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**Table S-2: Summary of Impacts of the Alternatives Retained for Detailed Evaluation, as Detailed in the DEIS<sup>1</sup>**

Alternative	No-Build	Yellow	Purple	Brown		Green	
				North Option	South Option	North Option	South Option
Resource	Existing roadways	On US 301 and SR 896 alignment	New alignment (ridge route) on SR 896 alignment (with spur)	New alignment (ridge route); new alignment from Summit Bridge to SR 1	New alignment (ridge route); new alignment from Armstrong Corner Road to SR 1 (with spur)		
Alignment Length (mi.)	0	19.4	16.9	17.5	15.9	17.5	17.3
Total Area (acres)	0	870	902	896	894	897	876
Res. Displacements (No.)	0	128	7	2	2	4	4
Bus. Displacements (No.)	0	58	5	4	4	8	7
Affected Properties (No.)	0	377	154	100	100	132	130
Wetlands (acres) <sup>2</sup>	0	50.5	24.9	23.9	18.5	26.2	28.3
Wetlands (No.)	0	33	45	39	35	43	40
Tidal Wetlands (acres) <sup>3</sup>	0	0.4	0.4	0.4	0.4	0.4	0.4
Waters of the US (lf)	0	20,708 <sup>4</sup>	16,257 <sup>4</sup>	15,158 <sup>4</sup>	14,278 <sup>4</sup>	15,515 <sup>4</sup>	16,326 <sup>4</sup>
100-Year Floodplain (acres)	0	1.5	1.5	1.0	1.0	1.0	1.0
Agricultural Districts (No./acres)	0	1/14.1	1/32.6	1/32.6	1/32.6	1/32.6	1/32.6
Agricultural Easements (No./acres)	0	0	1/6.0	1/9.4	1/12.4	1/6.0	1/6.0
Prime Farmland Soils (acres)	0	203	415	412	424	437	398
Hydric Soils (acres)	0	158	147	119	115	146	145
Upland Forested Land (acres)	0	36.9 <sup>5</sup>	39.9 <sup>5</sup>	37.4 <sup>5</sup>	51.0 <sup>5</sup>	34.1 <sup>5</sup>	36.8 <sup>5</sup>
Residential Noise Impacts (No.)	0	74	108	67	64	77	63
Residential Noise Impacts after Proposed Visual Berms (No.)	0	74	77	14	27	32	32
National Register Historic Properties: Physical (No.)	0	4	0 <sup>6</sup>	0 <sup>6</sup>	0 <sup>6</sup>	0 <sup>6</sup>	0 <sup>6</sup>
National Register Historic Properties: Visual or Noise (No.)	0	19	22	17 <sup>7</sup>	16 <sup>7</sup>	21	21
Capital Cost (\$M) (2006 dollars)	0	\$686-\$758	\$616-\$680	\$550-\$608	\$499-\$551	\$534-\$590	\$526-\$582

NOTES: 1. Based on preferred options for Armstrong Corner Road Area, Boyds Corner Road Area, and Summit Interchange Area. Impacts based on Limit of Disturbance as defined and as reported in the DEIS. 2. Total area of potential ACOE wetlands impacted. 3. DNREC tidal wetlands acres included in total wetland. 4. Does not include waters within wetlands. lf = linear feet. 5. Does not include forests in wetlands. 6. One historic archaeological site for which National Register eligibility has not been determined will be directly impacted by the Purple, Brown and Green Alternatives. 7. One additional property for which National Register eligibility has not been determined will be affected (visual and/or noise) by the Brown Alternatives. Refer to Chapter III, Section B.

## **J. Permits Required**

The following permits, approvals and agreements will be completed prior to commencement of the construction of a build alternative:

- National Environmental Policy Act Process, including the Final Environmental Impact Statement, Record of Decision, and Reevaluations;
- Section 106 of the National Historic Preservation Act as memorialized in the Memorandum of Agreement among FHWA, DelDOT, the DE State Historic Preservation Officer, the Maryland Historic Trust (MD SHPO) and any consulting parties that may be identified;
- Biological Assessment and Informal Consultation with the USFWS and DNREC;
- ACOE Individual Permit for Impacts to Waters of the US, including wetlands, under Section 404 of the Clean Water Act;
- DNREC Wetlands and Subaqueous Lands Permit;
- DNREC Water Quality Certification under Section 401 of the Clean Water Act;
- DNREC Coastal Zone Management Program Federal Consistency Determination;
- Delaware Forest Conservation Act;
- Maryland Reforestation Law;
- National Pollution Discharge Elimination System permit;
- DNREC Erosion and Sediment Certification (DelDOT is designated agency);
- Floodplain determination and assessment under Federal Executive Order 11988, US Department of Transportation Order 5650.2, National Flood Insurance Act of 1968;
- New Castle County Floodplain Permit; and
- Joint Federal/State Permit for the Alteration of any Floodplain, Waterway, Tidal, or Non-Tidal Wetland in Maryland.

## **K. Public Involvement Program**

The Public Involvement Program for the US 301 Project Development effort has included extensive interaction with members of the public through stakeholder interviews, individual and community meetings, public workshops, and outreach through mailings, announcements, bulletin boards, a project office and a project website. Close to 100 individuals were initially contacted during stakeholder interviews. The project mailing list was initially developed from zip code listings and continually updated throughout the project process. Members of the Project Team met with individuals, business owners, and various community organizations to provide a more individualized interaction about project issues. Five sets of Public Workshops and a Public Hearing provided the community an opportunity to interact with members of the Project Team, view displays, hear presentations, and offer comments about the project's purpose and need, alternatives and impacts. The Project Office was opened in July, 2005 to provide a "drop-in" opportunity for members of the public to discuss the project with Team members, and the project website, [www.us301.org](http://www.us301.org), contained updated information about all facets of the project as well as a link to provide comments directly to DelDOT. Information about the project can still be obtained on DelDOT's website at [www.deldot.gov/information/projects/us301/](http://www.deldot.gov/information/projects/us301/).

## **L. Areas of Controversy**

As described throughout this FEIS, the US 301 Project Development process has included an extensive public involvement effort. Ongoing coordination with local, state and federal regulatory agencies and elected officials has addressed most controversial issues associated with the project. Where necessary, DelDOT has clarified facts regarding the project and discussed issues with interested parties. Development of alternative options, modifications to alignments, and other adjustments to the project scope of work have been made to address new issues as they were raised.

Examples of areas of controversy that have been identified during the project and addressed in this FEIS include:

- Individual property acquisition of residences, businesses, and community facilities, including Summit Airport
- Potential impacts to the Federally-threatened bog turtle
- Origin and destination of traffic; addition of Spur Road to meet project Purpose and Need on the Purple and Green Alternatives.
- Substantial environmental effects of the Blue and Red Alternatives
- The potential effects of the project's build alternatives on secondary growth
- Safety and access requirements at the proposed interchange south of Summit Bridge
- The effects of the build alternatives on travel patterns and traffic volumes (especially truck travel), including within Kent and Cecil Counties, Maryland from the effect of toll diversion
- Determination of resources eligible for the National Register of Historic Places and assessment of adverse effects
- Noise impacts on project area residents and means to mitigate or reduce/eliminate noise effects
- Identification of the Preferred Alternative
- Issues regarding the need for the Spur Road and minimization of the impacts associated with the Spur Road
- Impacts to two long-term family-owned and operated farms in the Ratledge Road area with regard to wetlands, forest, and farmland impact avoidance and minimization
- The need for connectivity between farming communities east and west of the new US 301 for farm machinery access and safe travel

## **M. Next Steps in the Project Development Process**

Following the review of this Final Environmental Impact Statement, any comments received will be considered and addressed in the Record of Decision (ROD) to be completed by the Federal Highway Administration. The ROD will finalize the NEPA process and identify a Selected Alternative, and the basis for the decision, to complete the project.

**N. Statutory Provisions**

A Federal agency may publish a notice in the Federal Register, pursuant to 23 USC § 139(l), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal agency actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

**O. Summary of Costs and Financial Analysis**

The US 301 project is proposed to be funded primarily through toll revenue bonds supported by tolls at four potential toll collection facilities along the build alternatives: 1) both directions at a US 301 mainline plaza located just north of the Delaware-Maryland Line; 2) north serving (to and from the north) interchange ramps at Levels Road; 3) north serving ramps at existing US 301 north of Armstrong Corner Road; and 4) north serving ramps to Jamison Corner Road. However, preliminary projections indicate that the toll revenues may not be adequate to completely fund the total estimated cost of the project. State Transportation Trust Funds (TTF), TTF revenue Bonds, Federal funds, or Federal Grant Anticipation Revenue Vehicle (GARVEE) Bonds could be used to provide the remaining required funds. Options involving these and other potential funding sources will be evaluated.

In accordance with FHWA guidance (Federal Register; January 5, 2001), DelDOT will submit a final Financial Plan for the funding of the Selected Alternative concurrent with or shortly after a ROD is issued. The capital cost estimate for the Preferred Alternative (\$534 to \$590 million) is shown in **Table S-1**.